To the claims:

1. (Currently amended) A two-mode plasma containment apparatus, comprising:

a plasma containment housing;

a containment volume disposed within the housing, the containment volume having a containment dimension;

a plasma disposed within ~~a~~ the containment volume ~~having a containment dimension~~, said plasma comprising a number of electrons and a number of ions, ~~and~~ wherein said electrons act as charge carriers in a current established in said plasma, and wherein there is at least a partial separation in distributions in the electrons and ions; ~~and~~

a current disposed within the plasma, the electrons acting as charge carriers for the current;

~~a magnetic field that influences said electrons substantially more than said ions such that said electrons are magnetically confined as a first mode of confinement to an electron confinement volume that is smaller than said containment volume so as to cause at least a partial separation in distributions in said number of electrons and said number of ions, wherein said separation induces an electrostatic field that facilitates confinement of said ions as a second mode of confinement within said containment volume.~~

a magnetic field operatively disposed at the containment volume, the magnetic field configured to confine the electrons;

a confinement field generator operatively attached to the housing, the confinement field generator configured to generate the magnetic field;

an electron confinement volume disposed within the containment volume, the electron confinement volume being smaller than the containment volume, the electrons being substantially magnetically confined within the electron confinement volume;

an electrostatic field disposed in the containment volume resulting from the at least partial separation in distributions, the electrostatic field facilitating confinement of the ions within the containment volume.

2. (Currently amended) The apparatus of Claim 1, wherein the electron confinement volume has a dimension in the range between approximately 1 to approximately 1000 electron skin depths, the electron skin depth being defined in terms of the average number density of the electrons.

3. (Currently amended) The apparatus of Claim 1, wherein the electron confinement volume has a dimension in the range between approximately 1 to approximately 100 electron skin depths, the electron skin depth being defined in terms of the average number density of the electrons.

4. (Currently amended) The apparatus of Claim 1, wherein the electron confinement volume has a dimension in the range between approximately 1 to approximately 60 electron skin depths, the electron skin depth being defined in terms of the average number density of the electrons.

5. (Currently amended) The apparatus of Claim 1, wherein the electron confinement volume has a dimension in the range between approximately 1 to approximately 40 electron skin depths, the electron skin depth being defined in terms of the average number density of the electrons.

6. (Currently amended) The apparatus of Claim 1, wherein the electron confinement volume has a dimension in the range between approximately 1 to approximately 10 electron skin depths, the electron skin depth being defined in terms of the average number density of the electrons.

7. (Currently amended) The apparatus of Claim 1, wherein the electron confinement volume has a dimension in the range between approximately 1 to approximately 2 electron skin depths, the electron skin depth being defined in terms of the average number density of the electrons.

8. (Currently amended) The apparatus of Claim 1, wherein the electron confinement volume has a dimension of approximately 1.2 electron skin depths, the electron skin depth being defined in terms of the average number density of the electrons.

9. (Withdrawn) The apparatus of Claim 1, wherein the containment volume is substantially cylindrical in shape.

10. (Currently amended) The apparatus of Claim 1, wherein the ~~containment volume~~ housing is substantially toroidal in shape.

11. (Withdrawn) The apparatus of Claim 1, wherein the electrons are confined by the magnetic field using Z-pinch confinement.

12. (Withdrawn) The apparatus of Claim 1, wherein the electrons are confined by the magnetic field using theta-pinch confinement.

13. (Currently amended) The apparatus of Claim 1, wherein the magnetic field is configured to confine the electrons ~~are confined by the magnetic field~~ using a combination of Z-pinch and theta-pinch confinement.

14. (Currently amended) The apparatus of Claim 1, wherein ~~operating parameters of~~ the plasma ~~are~~ is subject to a restriction in a first beta value and a second beta value associated with the plasma, wherein the first and second beta values depend~~s~~ on factors comprising average number density, average temperature of the plasma, and strength of the magnetic field components, and wherein the inverse of the first beta value is between approximately 0 and 22, and the inverse of the second beta value is between approximately 0 and 3.

15. (Original) The apparatus of Claim 1, wherein a contribution of the electrons to the current is relatively more than a contribution of the ions to the current.

Claims 16-17 (Canceled)

Claims 18-88 (Canceled)

89. (New) The apparatus of Claim 1, wherein the plasma is subject to a restriction in a first beta value $\beta = N_0 kT_0/(B_0^2/2\mu_0)$, and wherein the net axial current $I = 2\pi a B_\theta(a)/\mu_0$ is replaced with a second beta value $\alpha = N_0 kT_0/(B_\theta(a)^2/2\mu_0)$, and wherein $1 < 1/\alpha < 3$ and $10 < 1/\beta < 22$.